Appendix A

Summary of Area History and Current Uses

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Appendix A – Summary of Area History and Current Uses

This appendix summarizes the history and current uses of the Terminal 4 Removal Action Area. The information presented is excerpted from the detailed account that was provided in the work plan (BBL, 2004) and incorporates any new information discovered since that time.

A.1 Removal Action Area and Terminal 4 Boundaries

The Port of Portland's Terminal 4 facility, located at 11040 North Lombard Street, Portland, Oregon, is within or adjacent to the Portland Harbor Superfund Site. The Terminal 4 Removal Action Area is bordered to the north by Schnitzer Steel Industries and Northwest Pipe and Casing; to the north/northeast by the Burgard Industrial Park; to the south by the Terminal 4 Auto Storage Area, which is occupied by Toyota; to the east by Union Pacific rail tracks; to the southeast by a Toyota lot; and to the west by the Willamette River.

The Removal Action Area is that portion of the Portland Harbor Superfund Site adjacent to and within Terminal 4 that extends west from the ordinary high water line on the northeast bank of the lower Willamette River to the edge of the navigation channel and south from the downstream end of Berth 414 to the downstream end of Berth 401, including Slip 1, Slip 3, and Wheeler Bay.

A.2 Cultural Resources

Information presented in this section is summarized from A Cultural Resources Reconnaissance Survey of the Port of Portland's Terminal 4, Portland, Oregon (Final Draft) (AINW, 2003), which was prepared by Archaeological Investigations Northwest. The complete report has not yet been approved for public release.

Copies of the draft cultural resources report for Terminal 4 were provided to all six Tribes on August 11, 2003, and a meeting was held with Tribal representatives to discuss the Terminal 4 cultural resources report on October 7, 2003. No comments or concerns regarding the report or cultural resources at Terminal 4 were expressed at the October 7 meeting. Letters requesting Tribal concurrence with the report and its findings were sent to the Tribes on February 10, 2004, and responses were received. The Port will revise the cultural resources report as appropriate, and prepare an Archeological Monitoring Protocol after USEPA selects the remedy.

A.2.1 Native American Cultural Resources

Terminal 4 lies within the traditional homeland of the Chinookan peoples who occupied most of the lower Columbia River valley at the time of Euroamerican contact. The present Portland area was historically occupied by groups speaking two Upper Chinookan dialects, Multnomah and Clackamas. The confluence of the Willamette and Columbia rivers and the Lower Willamette River were major resource locations and regularly drew native peoples from throughout the Columbia River drainage for seasonal fishing and trading expeditions (French and French, 1998; Silverstein, 1990).

William Clark of the Lewis and Clark Expedition made a brief exploration up the Lower Willamette River in April 1806. He and his men camped near a small Chinookan village on the east bank of the Willamette. Clark's description and maps of the location indicate this village may have been in the vicinity of Terminal 4. The village, designated "Ne-mal-quin-ner's," had an estimated population of 200. The residents of the village were absent at the time of Clark's visit and he was told by his Indian guide that the Ne-mal-quin-ner's people usually lived at Willamette Falls, moving to the lower river settlement "when they Come down to the Valley to gather Wappato" (Moulton, 1990, 1991).

There are no written references to the Ne-mal-quin-ner village or any settlement at that location after the time of the Lewis and Clark Expedition; a well-known archaeological site at the mouth of Gatton's Slough (the lower course of the slough was buried by construction of Terminal 4) is likely to be the remains of Ne-mal-quin-ner's village. Prior to construction of Slip 1, Gatton's Slough was formerly a natural surface drainage feature discharging to the Willamette River. John Wacheno, a Clackamas Indian, told an anthropologist in 1934 of a village in the St. Johns area known as wÜxsûn, the residents of which fished for sturgeon at the mouth of the Willamette River (Drucker, 1934). Treaties in 1855 led to the relocation of many Chinookans, and other native peoples who had traditionally used the Lower Willamette River, onto reservations. Accounts of early settlers in the St. Johns area indicate, however, that some Indians remained along the river through the 1850s and into the 1860s (Dickson, 1976; Singleterry, 1976). Other Indians are known to have left the reservations seasonally to visit traditional resource locations.

Other than the archaeological site at the mouth of Gatton's Slough, the only reported archaeological resources at Terminal 4 are a few artifacts apparently collected in the 1960s and 1970s by a former worker at the terminal. One of these artifacts was a net weight collected from under Pier 5 in Slip 3 (Schenkenberger, 1981).

An archaeological reconnaissance survey of Terminal 4 conducted in January 2003 included an examination of the accessible banks and beaches. The bank exposures indicated that they are composed of dredged sands and silts. No evidence of any archaeological resources associated with American Indian use or occupation was observed (AINW, 2003). However, the alignment of the historical-period Willamette River bank and the banks of the former Gatton's Slough have been identified as high-probability areas for archaeological resources associated with American Indian use and occupation of the Terminal 4 area (AINW, 2003).

A.2.2 Early Euroamerican Activity

Few non-Native uses of the location prior to 1917, when construction of Terminal 4 began, have been documented. A Donation Land Claim encompassing the future Terminal 4 location was settled in 1846 by James Loomis and his family, who built a cabin along the bank of the Willamette River (although this occupation was probably short-lived). By the 1890s, however, the only use of the Terminal 4 location appears to have been for grazing cattle and possibly growing hay. The future Terminal 4 location was purchased in 1897 by the Ogden family, but the new owner did not develop the area, opting instead to build a home on higher ground to the northeast.

More intensive development occurred in the years before World War I. A dock where ships transferred oil to the Union Pacific Railroad and an associated pipeline were built in approximately 1906-07 along the south side and to the east of the future location of Slip 3 and in approximately 1907-08, the railroad was constructed along

the eastern edge of the floodplain. These are the only known uses of the Terminal 4 location prior to construction of Terminal 4, which began in 1917.

A.3 Physical History of the Terminal 4 Area

The landscape and physical features of the Terminal 4 area have changed significantly in the past century. The rural landscape began changing in the first decade of the 1900s, when what was once Willamette River floodplain was modified by grading, dredging, and filling as early as 1906 to 1907.

Prior to development, the banks of the terminal location were lined with trees, and Gatton's Slough (which discharged to the Willamette River) traversed the northern portion of the property (U.S. Coast and Geodetic Survey, 1895). A small stand of trees was located on the floodplain immediately south of the slough, beyond which were several small swales and ponds. The remainder of the area was occupied by grasslands, which were probably wet prairies. A U.S. Coast and Geodetic Survey (USC&GS) map from 1895 depicts a building (possibly a farmhouse) located at the eastern edge of the floodplain (southeast of the location of the now-removed Warehouse 6) along with a series of trees suggestive of a small orchard.

In 1897, the Ogden family purchased the land around lower Gatton's Slough. They built a house on the higher ground overlooking the floodplain, probably close to the modern entrance to Terminal 4 on North Lombard Street. In addition to farming, the Ogden family reportedly drilled for oil near the mouth of the slough, without success (Minkler, 1976).

The rural landscape portrayed in the 1895 map began changing in the first decade of the 1900s. The first developments at Terminal 4 occurred between 1906 and 1908, when the Oregon-Washington Railroad and Navigation Company (OWR&N, a Union Pacific Railroad affiliate and part of the Union Pacific system, hereafter referred to as Union Pacific) constructed the railroad along the eastern edge of the floodplain (the railroad alignment now serves as the eastern boundary of Terminal 4) and a pipeline and oil dock along the south side of the modern Slip 3. By 1912, Union Pacific had completed its oil-supply facility for fueling locomotives, to include the St. Johns Tank Farm, which was adjacent to Terminal 4 on the east slope above the rail tracks. Photographs from 1917 indicate that an oil pipeline extended east from the river across the floodplain to the tank farm. The oil pipeline later became an underground structure, and was presumably buried when the area of Slip 3 was filled and graded for development, however, the date of burial has not been confirmed. The pipeline alignment was along the south side of where Slip 3 would later be constructed and the oil was pumped uphill from the oil-supply dock to the tank farm.

In 1917, site preparation for the development of Terminal 4 began. Trees and other vegetation were removed over most of the floodplain in the northern Terminal 4 area, and dredged fill material was deposited across the low-lying ground and then leveled by horse teams. Most of lower Gatton's Slough was filled at this time as well. Beginning about the same time, fill was also placed into the offshore shallows to extend the riverbank out into the channel. The 1895 U.S. Coast and Geodetic Survey map labeled the offshore area as "Linton Shoal," with water less than a meter deep in places. Filling this area was relatively easy and provided the new Terminal 4 with a larger land base. As described in more detail below, the northern Terminal 4 facilities were Piers 1 and 2 at Slip 1 and Pier 5 at Slip 3. A Slip 2 was planned and partially excavated but never completed. The remnant Slip 2 is known today as "Wheeler Bay." Photographs taken in 1917 trace the rapid transformation of this landscape (Port of Portland, 1917).

Pre- and post-construction maps and plans for Terminal 4 indicate substantial changes occurred in the landscape from 1917 to approximately 1921 (AINW, 2003). First, construction of the terminal involved placement of fill that extended 650 to 975 feet from the original riverbank. Second, the construction of Slips 1, 2, and 3 also required excavations into the original shoreline. Slip 1 was located at the entrance to Gatton's Slough, and the head of the slip extended up to 650 feet inland from the original riverbank. These excavations probably removed much of the upriver portion of the mouth of the slough; the downriver portion of the slough entrance was covered by Houses 1 and 2 at Pier 1 and portions of the grain complex. The inland excavations for Slips 2 and 3 extended from 440 to 565 feet back from the original shoreline. (Slip 2 was never completed, and the remnant of Slip 2 is known today as Wheeler Bay.) The northern portion of Terminal 4 was thus developed through a combination of fill outward from the original riverbank and excavations into the original floodplain. All traces of lower Gatton's Slough were lost either through burial under fill or removal for the creation of Slip 1.

According to Port records, Slip 2 was filled in two stages by the City of Portland Commission of Public Docks (City CPD). The first stage occurred in July 1948. At that time, the City CPD requested the Port conduct dredging operations south of Pier 5 in connection with the construction of an oil dock for Richfield Oil Company. The City CPD made available the head of Slip 2 for the disposal of dredged material. Also in July 1948, the City CPD contracted with General Construction for dredging Slip 3; however, the disposal location for dredged material generated from that event has not been verified.

The second stage of filling Slip 2 occurred in 1957-58 in conjunction with the widening of Slip 3. The widening of Slip 3 was part of the overall plan for the construction of Pier 4, which was sited on the north side of Slip 3. The City CPD contracted with a private entity, General Construction Company, for the widening of Slip 3, which included dredging and construction of a hydraulic fill. City CPD drawings indicate the hydraulic fill was placed at the head of Slip 2, which thus created the upland as it is configured today.

A.4 Chronology of Ownership and Operations

A.4.1 Property Acquisition and Development History at Terminal 4

Originally called the St. Johns Municipal Terminal, Terminal 4 was developed by the City CPD as a result of the push by the City to become a world-class shipping port and to capitalize on growth in the shipping industry following the opening of the Panama Canal in 1914 (Donovan and Associates, 1997). Following the physical preparation of the land, the City CPD initiated construction for development of the property as a marine terminal.

The main building construction and other physical developments at Terminal 4 are summarized in Table A-1. Note that warehouses at Pier 1 were called "houses," while those at Pier 2 were called "warehouses."

Table A-1
Chronology of Development at Terminal 4

Year	Entity and Event
1906-07	St. Johns Tank Farm (with storage tanks and a pipeline to a terminal dock) constructed by Union Pacific at the future location of Slip 3; the facility handled Bunker C fuel oil for fueling steam locomotives south of modern Slip 3.
1917	$3,000,000 bond levy approved on June 17, 1917, for land purchase and development. City CPD purchases 117.55 acres of upland and purportedly 36 acres of submerged land centered on Gatton's Slough.
1917-20	Slips 1 and 3 dredged and Pier 1 (Berths 403-405), grain elevator, operating house, storage bins, track shed, and Warehouses 1-5 constructed. Spur tracks from existing Union Pacific lines constructed.
1919	Liquid bulk storage facility constructed at the head of Slip 1; House 4 constructed.
1919-20	Pier 2 and Berths 406-408 constructed. Vegetable oil weighing house constructed east of Slip 1.
1920	4.94-acre parcel acquired from Union Pacific adjacent to Slip 3; however, parcel developments (pipeline, oil supply tanks, and fuel oil dock) remained under ownership of Union Pacific. Flour mill, adjoining concrete warehouse for grain and flour, and Berth 409 constructed. Houses 1 and 2 constructed on the upstream side of Slip 1. Boiler house and service buildings (including an administration building, cafeteria/restaurant, and welfare building) constructed east of Slip 1.
1920-21	Substructure for Piers 3, 4, and 5 constructed (although Pier 3 was never completed). Quay dock, bulk handling facility, and Berths 412 and 413 completed on the upstream side of Slip 3. Union Pacific pipeline extended to service Berth 412 at Pier 5, Slip 3.
1920-24	Filling platform for liquid bulk storage facility constructed east of Slip 1.
1921	Storage bunkers constructed east of Slip 3.
1921-22	Warehouses 6 and 7 constructed on Pier 2, Slip 1 serviced by Berths 406 and 407.
1922	House 5 constructed perpendicular to House 4 along the river.
1923	Houses 6, 7, and 8 were constructed perpendicular to House 5 as a cold storage plant and ventilated warehouse. 150,000-gallon elevated water tank constructed. H.R. Leckenby fumigation plant constructed.
1930	Grain storage annex constructed north of the grain elevator.
1931	Tanks added to liquid bulk storage facility.
1932	Gearlocker building constructed north of the liquid bulk storage facility.
1940-41	Berth 401 and Airveyor system for unloading bulk grain from barges constructed on the harbor side of Houses 4 and 5 at Pier 1 for grain unloading.

Year	Entity and Event
1942	At the onset of WWII, the U.S. Army Transport Service (USATS) leased Terminal 4 from City CPD for Portland's Sub-Port of Embarkation. USATS added a second story to the gearlocker building. The USATS rehabilitated the loading apron at Pier 1, replaced decking and rehabilitated railroad track at Pier 2, and rehabilitated the slip side of Pier 5.
1944	Auxiliary pipeline constructed by the USATS at Slip 3 Pier 5.
1946-47	The USATS relinquished Terminal 4 to City CPD. Bulk loading facility constructed at Berth 412 on the slip side of Pier 5.
1948	20-acre parcel south of Pier 5 acquired from Union Pacific. Head of Slip 2 partially filled following dredging for construction of Union Pacific oil dock located along the Willamette River south of Pier 5. Slip 3 dredged.
1951	A railcar dumper and a hydraulic truck unloading hoist and dust collection system added to the grain facility at Pier 1.
1953	Oil packaging plant constructed and eight aboveground storage tanks (ASTs) and an underground transfer pipeline installed at the head of Slip 3 by Quaker State for oil storage.
1954	Eight steel ASTs for grain storage constructed east of the grain storage buildings at Slip 1. Electric elevator system at grain elevator modernized.
1955	Pier 2 rehabilitated and two gantry cranes added. Fumigation plant removed.
1957	Berth 401 renovated.
1957-58	19.64-acre parcel upstream of Pier 5 acquired from Multnomah County. Slip 3 widened for the construction of Pier 4 and filling of head of Slip 2 completed.
1958	Second gallery for grain loading added at Pier 1.
1959-60	Pier 4 (Berths 410 and 411) constructed on the downstream side of Slip 3.
1962	Pier 5 harbor-side wharf and Berth 409 at the head of Slip 1 removed. Dravo bulk unloader installed at Pier 4.
1963	Head of Slip 1 developed as small boat landing.
1966	Five tanks constructed by Pacific Molasses added to liquid bulk storage facility.
1968	Warehouse 4 constructed at Pier 2. Matson Navigation Co. installed 33-ton-capacity container crane on Pier 2. Three 36-ton revolver cranes purchased and installed at Pier 4.
1968-69	Berths 404 and 405 reconstructed (Berth 405 to handle offloading of barges for grain). Coal bunkers removed at Pier 5.
1971	Grain elevator remodeled; Union Pacific abandoned existing pipeline to St. Johns Tank Farm and installed a replacement pipeline; Port and City CPD consolidated; except for City's fire boat station, CPD properties and functions transferred to Port.

Year	Entity and Event
1973	Land purchased from Broadway Holding Company. House 8 demolished at Pier 1. Berth 417 constructed southwest and upstream of Slip 3.
1975	Berth 401 reconstructed to handle ships, adding grain loading equipment and conveyor system.
1978	Cold storage plant and ventilated warehouse (Houses 6 and 7) at Pier 1 removed.
1983	Union Pacific's operation of the St. Johns Tank Farm tanks and replacement pipeline ceased.
1984	Boat landing at the head of Slip 1 removed and ro-ro dock, called Berth 409, constructed in its place. Service buildings removed, including an administration building, cafeteria/restaurant, and welfare building. Whirley cranes removed from Berths 410 and 411.
1985	Quaker State ASTs and underground pipeline removed.
1986	City of Portland began construction of Outfall 52C and the associated storm sewer system serving Lombard Street properties.
1987	Bulk outloading facility constructed at Pier 4 by Hall-Buck Marine. Construction of City drainage system and Outfall 52C at the head of Slip 1. Tanks removed from Union Pacific's St. Johns Tank Farm.
1988	Diesel and gasoline underground storage tanks (USTs) and fueling station installed by Oregon Terminal Company.
1989	Second railcar dumper added to grain facility. Two pipes added at Pier 1 for liquid bulk storage facility.
1990	House 4 condemned.
1991	Guard station constructed.
1992	Four of the steel ASTs for grain storage (east of the storage bins to the north of Slip 1) modified.
1992-93	Downstream row of tanks at original liquid bulk storage facility removed.
1994-95	All but five of the tanks remaining at liquid bulk storage facility removed.
1995	Soda ash storage building constructed at Pier 4.
1996	House 6, House 7, Berth 406, and Berth 407 at Pier 2 dismantled.
1996	Oregon Terminal Company's diesel and gasoline USTs removed.
1997	Pipeline for liquid bulk storage facility rebuilt under Berth 408.
1997-98	Portions of Union Pacific's decommissioned/abandoned St. Johns Tank Farm pipeline removed from under Berth 412 and elsewhere.

Year	Entity and Event
1999	Houses 3, 4, and 5 and Berths 403 and 404 demolished. Mechanical/electrical building and bridge to Berth 401 constructed.

A.4.2 Historical Terminal Operations

Tenant operations at Terminal 4 are discussed here by operating areas, further subdivided by the piers and berths the tenants used.

Union Pacific Railroad

As discussed above, Union Pacific and its predecessor, OWR&N Co., built, maintained and operated a fuel oil dock, 10-inch steel pipeline, and the St. Johns Tank Farm and tank car loading facility near Pier 5 on the south (upstream) side of Slip 3 beginning in at least 1906 to 1907. The tank farm and loading facility included two 55,000-barrel aboveground storage tanks (ASTs) for oil and associated pumping and heating facilities. The tanks and the pumping and heating facilities were adjacent to the terminal on the bluff beyond the rail trackage east of Pier 5. The pipeline was used to transfer diesel fuel and, prior to 1955, Bunker C oil from marine vessels to the storage tanks, which delivered fuel oil via a loading rack on the main rail line above the terminal to locomotive steam engines and to rail tank cars for distribution to other facilities elsewhere in Union Pacific's system. Track scales were built to avoid having to transport cars to the railroad yard, which was some distance away. The track scales were operated under the supervision of the Weighing and Inspection Department of the Transcontinental Freight Bureau.

The City CPD purchased two parcels of land from Union Pacific that contained the pipeline and dock at Terminal 4, Pier 5 but not the tank farm: approximately 5 acres in 1920 and approximately 20 acres in 1948. The 1920 and 1948 deeds retained an easement for the existing pipeline that served the St. Johns Tank Farm on Union Pacific's property east of the terminal. The easement granted the railroad and its successors the right to operate and maintain the pipeline and associated dock.

From 1922 to 1939, General Petroleum Corporation leased the St. Johns Tank Farm from Union Pacific and operated a facility near Slip 3 for delivery of bunker fuel and unloading of fuel oil from vessels. Included in their operation was an approximately 30-ft AST used for fuel oil and two associated buildings, one of which was a designated pump house. All three structures were located along the area of the pipeline to the south of Slip 3 (Sanborn Fire Insurance Map, 1924). Neither the date of construction nor the date of demolition of these structures could be verified.

In 1952, Union Pacific requested an area for cleaning railcars and was offered the use of Track 10½ by the City CPD.

In 1969, Union Pacific leased the St. Johns Tank Farm and associated pipeline to Standard Oil Company of California (now known as Chevron). The arrangement provided that Standard Oil would supply Union Pacific with oil for its tank cars.

In 1971, Union Pacific abandoned the pipeline because of leaks. A new pipeline was then constructed parallel to the old one, but farther to the south across the adjoining 19.5-acre parcel. Standard Oil continued to operate

the tank farm and replacement pipeline until 1983, when fuel transfer operations ceased altogether. The tanks were removed in 1987. In 1997, during removal of the dock at Berth 412, the under-dock portions of the pipeline were drained, cleaned, and removed. In 1998, other portions of the pipeline were drained and removed.

Cargill Grain Facility

The grain elevator and its operating house were completed in 1920 and were operated by the City CPD. The facility contained a conveyor belt system that carried sacked grain to the elevator for cleaning and storage. Northwest sacked wheat was susceptible to a wheat fungus known as smut. An initial lime scouring method for cleaning was later replaced when Wolf-Dawson wheat washers were installed. Dust collecting and sweeping systems controlled airborne particulates. A two-belt shipping gallery could load two vessels with bulk grain simultaneously. Track facilities were provided in the front and rear of the pier; the rear tracks had placement for 105 cars. The pier had cargo masts along its entire face, electric elevators, and electrically operated ramps for handling freight to and from river steamers and barges. The grain elevator had capacity to handle 1,053,800 bushels in eight hours. After the construction of the grain elevator annex in 1930, its grain-storing capacity of 2,000,000 bushels exceeded that of any other grain elevator on the Lower Columbia (Merchants Exchange Journals, 1932).

Barge delivery of bulk wheat to the grain elevator began to supplant sack delivery in 1939. The following year, the City CPD installed a Fuller Airveyor vacuum system for unloading grain barges in Slip 1. Another, higher-capacity vacuum system was added in 1957. Eight grain storage silos are located east of the grain terminal. When these were built and put into operation in 1954, the grain storage capacity at Terminal 4 increased to 7,400,000 bushels. To more readily accommodate grain delivery at the enhanced storage facility, a new box car unloader was added.

In 1942, Terminal 4 and operation of the grain facility were turned over to the U.S. Army Transport Service (USATS). In 1947, the facility was returned to the City CPD, which entered into a lease agreement with Kerr-Gifford. Kerr-Gifford operated the grain elevator at Pier 1 from 1947 until 1954. In 1953, Cargill agreed to purchase all of the stock of Kerr-Gifford, and in November 1954, Kerr-Gifford was merged into Cargill as the Kerr Gifford Division. It was at that time that Kerr-Gifford's lease of the grain terminal was assigned to Cargill. Table A-2 summarizes the facilities Cargill used in connection with their operation of the grain facility.

Table A-2
Cargill Operating Areas at the Grain Facility at Terminal 4

Year Constructed	Cargill Facility	Location(s)	Use/Former Use	Status
1917	Transformer House	Southeast of Pellet Mill between the Operating House and Storage Silos	Transformer storage	Razed in 1977
1920	Operating House (grain elevator)	South of Storage Annex	Transfer of grain	Present
Prior to 1940	Conveyor to Berth 405	Extends south of the Operating House to Berth 405	Grain transport	Present
Prior to 1953	Track Shed	South of Operating House	Cover for rail trackage	Present
Prior to 1953	Truck Dumper	East of Track Shed	Unloading trucks	Present
Circa 1954	Grain Storage Silos (8)	East of Operating House	Grain storage	
Circa 1954	Railcar Tipper	South of Track Shed	Unloading grain from railcars	Present
1955	Deep Water Well	Southeast of Storage Annex (northeast of Operating House)	Turbine pump	Abandoned and filled in 1992
1958	Millwright Shop	West of Operating House	Not confirmed	Removed
1970s	Conveyor Building (Building C-10)	West of Office Building	Conveyor equipment	Present
1970s	Maintenance Shop	East of Operating House	Equipment maintenance	Present
1975	Office Building (Building 168)	West of Flour Mill	Administrative offices	Present
1975	Conveyor to Berth 401	Extends west from the Operating House to Berth 401	Grain transport	Present
1976	Truck Shed (Building 178)	North of Building C-10	Covered way for trucks	Present
1980s	Longshoremen's Lunchroom	Adjacent to Berth 401	Longshoremen's facility	Present
1994	Pellet Mill	East of Storage Annex	Processing beet pellets	Present
1999	UIC Dry Well	Near Berth 401	Stormwater Discharge	Present
Various Dates	Electrical Transformers	Various locations	Energy conversion	PCB-containing transformers replaced in 1988
Various Dates	Rail trackage	Throughout the leasehold	Transport of railcars and materials	Present

Year Constructed	Cargill Facility	Location(s)	Use/Former Use	Status
Not confirmed	Gearlocker	South of Railcar Tipper north of Berth 405	Storage of equipment	Present
Not confirmed	Blacksmith Shop	South of Grain Storage Silos	Not confirmed	Removed
Not confirmed	Oil Shack	North of Maintenance Shop	Not confirmed	Not available
Not confirmed	Bull Pen	Not confirmed	Not confirmed	Unknown
Not confirmed	Electrical Distribution Center	Adjacent to Berth 405	Transformer storage	Removed
Not confirmed	Work Pit	Beneath Railcar Tipper	Not confirmed	Present
Not confirmed	Fueling Facility	Between Buildings 152 and 160	Fueling equipment	Removed
Not confirmed	Diesel UST (1,000-gallon) (T4-20)	West of Operating House	Diesel storage	Removed 1989
Not confirmed	Fuel oil UST (1,000-gallon) (T4-21)	West of Operating House	Fuel oil storage	Removed 1989
Not confirmed	Fuel oil UST (500-gallon) (T4-22)	Beneath the Operating House	Fuel oil storage	Removed 1993
Not confirmed	Used oil UST (T4-85)	North of Compressor House	Used oil storage	Removed 1993
Not confirmed	Diesel AST (500-gallon) (T4-45)	West of Car Shed	Diesel storage	Removed September 2003
Not confirmed	Diesel AST (675-gallon) (T4-47)	Southwest of Operating House	Fueling locomotives and equipment	Removed September 2003
Not confirmed	Used oil AST (250-gallon) (T4-48)	North of Maintenance Shop	Used oil storage	Removed September 2003
Not confirmed	Sumps	Railcar Tipper, Building 141, Truck Dump, Building Basements	Discharge	Present
Not confirmed	Hydraulic equipment	Building C-10, near Track Shed, and west of Railcar Tipper	Various uses	Present

Cargill maintained preferential berthing rights throughout their occupancy at Berths 401 and 405. Cargill transported materials to and from Berth 401 via railcars that moved along trackage located between Berth 401 and the track shed. Materials were transported to and from Berth 405 utilizing the conveyor system. Cargill leased the grain facility until 2004.

Cold Storage Plant

The cold storage plant and ventilated storage warehouse, constructed at Pier 1 in 1923, provided refrigeration space for transit shipments of apples received for export. The facility, immediately north of the Pier 1 warehouses, was a concrete and brick structure divided into three compartments (Houses 6, 7, and 8).

The 1923 addition of the cold storage plant in the eastern third of the apple storage warehouse led to a five-year storage contract with the Apple Growers Association of Hood River (City CPD, 1923). The cold storage plant was 100 ft by 200 ft and had a capacity of 105,000 boxes. The ventilated apple storage warehouse adjoined the cold storage plant and had a capacity of 350,000 boxes. The Port of Portland led the ports of the Pacific in the shipment of apples; during an average year in the mid-1920s, approximately 1 million boxes were shipped.

H.N. Leckenby

In 1923, H.N. Leckenby constructed a fumigation plant near the head of Slip 1 (just in front of the modern International Raw Materials [IRM] tank location). In 1924, Mr. Leckenby began fumigating Oriental cotton received at the Port and other commodities (e.g., peanuts, rice, beans, and other foodstuffs). The plant reportedly had a capacity of 250 tons per day. City CPD minutes from the 1930s indicate that the plant operated under the name of NW Pesticide Company. During World War II, the Army may have used the fumigation plant in connection with its operations (further discussed below). According to City CPD minutes (City CPD, 1949), after the military had vacated the terminal, arrangements were made in 1946 for Mr. Leckenby to enter into a lease with the City CPD and continue operating the plant. The plant continued in operation until sometime in the mid-1950s.

Liquid Bulk Storage

In 1919, a liquid bulk storage facility was constructed at the head of Slip 1. By 1931, additional bulk storage tanks were added and the facility included a City CPD-operated warehouse, tank car cleaning facility, and an edible-oil cleaning pit. In 1947, the facility was leased to Pacific Molasses (which later became PM-Ag). Products handled included liquid fertilizer, molasses, molasses products, tallow, urea, caustic soda, and fats. By 1966, the liquid bulk storage facility had been upgraded to include 14 steel tanks on a concrete foundation. Liquid bulk materials were pumped directly from vessels to the tanks via one of two 8-inch pipelines at Pier 1 and Pier 2. The liquid bulks could then be weighed on a 60-ton-capacity scale and pumped into railcars at the filling platform. Up to 10 tank cars could be filled at one time. Pacific Molasses also made use of a car cleaning pit and a steam cleaning area northwest of its tanks to clean food products out of the railcars prior to their filling.

PM-Ag formerly utilized an approximately 8,000-gallon underground storage tank (UST) for storing diesel. The UST was decommissioned by removal in 1991.

Between 1992 and 1995, all of the original public tanks were removed; five private tanks remain in use at present. In 1995, the lease for the liquid bulk storage facility was assigned to IRM, which continues to operate the facility.

The Port removed an approximately 3,000-gallon diesel UST from the IRM leasehold in 1995. Based on confirmatory sampling, the DEQ subsequently issued a No Further Action determination for the UST.

Flour Mill

A 1919 agreement between the City CPD and the Eagle Flour Mills Company for the construction of a flour mill north of Slip 1 was transferred to Terminal Flour Mills Company in 1923. A flour production and storage facility was completed and in operation at Terminal Flour by 1925. Terminal Flour operated the facility until 1992, at which time Terminal Flour's lease was assigned to Cereal Food Processors, which continues to operate the facility.

The mill originally consisted of a concrete building and an adjoining concrete grain and flour warehouse (Donovan and Associates, 1997). An annex was added at a later date (circa 1924 to 1950). A system of conveyors, which originally provided the mill with grain from the neighboring grain storage facility, was abandoned in 1966, and a track pit was added to the facility to accommodate hopper bottom railcars. In addition, two rail spurs running between the eight grain storage tanks served to accommodate delivery of bulk flour from the mill. Sacked flour was loaded directly onto vessels docked at Pier 1 using a conveyor belt system. In 1925, the flour mill had a capacity of 1,500 barrels a day. The output was nearly all for export. The export of flour ceased following World War II when Terminal Flour modified its operation and began milling flour for U.S. consumption. Grain was brought into the silos by rail, milled, and sold either in bulk or in sacks. At present, Cereal Food Processors mills flour for Portland-area customers and sells its product in bulk, exporting the flour from the facility via truck or rail.

Terminal Flour Mills formerly utilized an approximately 10,000-gallon fuel oil UST located north of the flour mill, an approximately 1,000-gallon diesel UST located south of the flour mill, and an approximately 1,000-gallon fuel oil UST located south of the flour mill. All three USTs were reportedly decommissioned by removal by Terminal Flour Mills. However, based on currently available information, neither the date of installation nor the date of removal of the USTs has been confirmed.

Oregon Sulphur Company

Oregon Sulphur Company operated on the east side of Slip 3 at Pier 5, importing bulk sulfur beginning in at least 1920. In photographs from 1920, there appears to be an open storage area, and sulfur was unloaded via clamshell bucket using a locomotive crane. The material was placed on the pier adjacent to the bunkers, where it likely remained until being loaded into railcars.

Matson Lines

Warehouses 6 and 7 at Pier 2, called the "Old Matson Warehouse," were constructed in 1922 and were used in Matson Navigation Company's Hawaiian trade (City CPD, 1947). Matson operated a freight dock at Slip 1 from 1955 to 1985. Matson initiated containerized cargo operations in 1964 at Berth 408, which was formerly used for the loading of scrap iron. This location fits within space designated as Berths 406 to 408. Pacific Northwest products, such as refrigerated meat, fresh fruit, potatoes, other vegetables, and canned goods, were shipped in containers to Matson's Hawaiian terminals on a biweekly basis. Return containers delivered commodities such as sugar, pineapple (fresh and canned), and tuna. Molasses shipped in vessel holds was used

for ballast. Matson Navigation's agreement with the City CPD gave it preferential berthing at Pier 2 and provided for exclusive use of a paved portion of the yard south of the pier for Matson's container operations. Matson used space at Terminal 4 until expiration of the agreement in March 1982, at which time it transferred its container operations to Terminal 6 and discontinued the shipment of liquid molasses.

Quaker State

In 1953, Quaker State constructed an oil packaging (motor oil bottling) facility at the head (to the east) of Slip 3. The facility included an underground transfer pipeline, three 220,000-gallon tanks, one 42,000-gallon tank, four 10,000-gallon tanks, a main blending and bottling building, and a storage building. Bulk oil was brought in via railcars on the north side of the facility or via ships berthed at Pier 5, Berth 412. The oil was pumped directly to the tanks from the railcars or directly from vessels into the transfer pipeline that traversed from Pier 5 to the eight ASTs. The tanks, which were located west of the packaging plant building, were connected to the packaging plant via pipeline. Quaker State bottled motor oil in 1-quart containers; some of the oil was blended at the facility with detergent and with motor oils of different weights. Once the oil was packaged, it was loaded onto trucks or railcars via a spur track on the north side of the packaging plant.

Port drawings indicate that Quaker State also utilized a waste oil UST and a used oil AST located southeast of their main blending and bottling building. The UST was decommissioned in 1991. The date of removal of the AST has not been confirmed.

Quaker State continued its operations through 1985, when the ASTs and the abandoned underground pipeline were removed. The building was converted in 1985 to a new gearlocker building and electrical shop for Oregon Terminal Company. Port drawings indicate that a rail-covered shop work pit was constructed west of the gearlocker building and two USTs were installed east of the gearlocker building at that time.

Rail Development at Terminal 4

Terminal 4 had approximately 10 miles (of a projected 17 miles) of railroad line when operations began there in 1920. After the addition of the cold storage facility in 1922, approximately 15 miles of rail trackage served the terminal. City CPD annual reports (City CPD, 1927, 1931) subsequent to 1926 described the rail network as having a working capacity of 425 cars (130 at ship side) with the ability to accommodate up to 800 cars.

The USATS made additions to the terminal's rail network during its tenure between 1943 and 1947, constructing or repairing approximately 22 miles of rail trackage. The high-capacity movement of defense materiel through the Portland Sub-Port of Embarkation created railcar holding backlogs on the main lines. The War Department responded to this by leasing land adjacent to Terminal 4 and building a railcar storage yard to accommodate cargoes awaiting transshipment.

Following the facility's return to the City CPD, improvements were made in 1947 when additional trackage was installed for the new bulk outloader built by the City CPD at Pier 5, Berth 412 for handling expected coal and phosphate cargo. Rail improvements continued at Terminal 4 in the 1950s, including a spur track constructed in 1953 to serve the Quaker State oil packaging plant at the head of Slip 3, rail modifications to accommodate the addition of the Cargill grain storage tanks in 1954, the 1959 addition of rail lines for Pier 4 when it was

developed, and improvements in 1964 at the time of Matson's container terminal operation. More recently, in 1996 Hall-Buck Marine required modification of the rail network to accommodate its soda ash export facility.

In 1964, when Matson Navigation began container terminal operations at Pier 2, the rail infrastructure was assessed for container operations. In 1985, the north throat and grain leads into Terminal 4 were reconstructed. In 1987 and 1996, Hall-Buck Marine's lease operations required modification of the rail network near Slip 3.

Exported freight is the railroad company's responsibility until facility operators take delivery with their locomotive, as is the case with Kinder Morgan Bulk Terminals (KMBT). Responsibility remains with KMBT and the longshoremen while product is transferred to a ship's hold. When the ship's hatches are closed, responsibility for the cargo is transferred to the vessel owners and operators. The same process applies to imported cargo. While the product is in the ship's hold, it is the vessel owner/operator's responsibility. During transfer, the responsibility shifts to the terminal operator (tenant) and its agents (longshoremen). This status is in effect while the railcar is shifted to another siding and an empty car takes its place. Union Pacific, or another railroad company, assumes responsibility when the completed load is hooked up and pulled out of the terminal.

Army Transport Service Sub-Port of Embarkation

In January 1942, the USATS leased all of Terminal 4 for use as the Portland Sub-Port of Embarkation, and municipal shipping activities were shifted to City CPD Terminal 1 and old Terminal 2. The facility was used to embark troops for overseas, as well as to store equipment and materials, house Army personnel, refuel ships, and load ships for transport overseas. The War Department in turn leased property and buildings to subtenants (e.g., Northwestern Ice and Cold Storage Company), providing services at the Portland Sub-Port of Embarkation. During its tenure at Terminal 4, the USATS operated the facilities described below.

Disinfestation/Fumigation Plant. Between May and September 1943, the USATS constructed a disinfestation (fumigation) plant to the east of Warehouse 1 for delousing soldiers and prisoners of war prior to their embarkation or debarkation. (Maps and drawings from the war years refer to a House 1 on both Piers 1 and 2. A report from February 1944 notes that the disinfestation plant was located in the former Water Division repair shop, but that location has yet to be verified.) The disinfestation plant was designed to delouse 150 men and their clothing and belongings per hour. The prisoners of war were reportedly held at Warehouse 1 (including a "delousing area") prior to being transferred elsewhere. The materials used in the disinfestation process have not been confirmed. An Army directive of August 19, 1944 instructed military installations to use methyl bromide for disinfestation and fumigation.

Salvage Yard. The USATS established a small salvage yard at Terminal 4 for scrap metal (including scrap iron and ferrous metal) and rubber. A report from March 1943 noted the sale of more than 38,000 pounds of scrap iron and steel from salvage operations. The total tonnage of materials scrapped at the terminal during the USATS's tenure was close to 350 tons, with most of that sold in 1944. Some of the materials were sold to the Zidell Manufacturing & Supply Company, Alaska Junk Company, and California Bag & Metal Company. Aerial photographs indicate that the USATS filled the salvage yard area sometime around 1945.

Auxiliary Oil Pipeline. In February 1944, the USATS completed construction of an auxiliary pipeline at Pier 5, Slip 3. The pipeline extended 340 ft to the slip side of the pier. The Army also constructed two standpipes

adjacent to the slip to accommodate the auxiliary pipeline. The new line was built to permit tankers to transfer oil to upland facilities while other ships took on coal from the adjacent bunkers.

Other USATS Facilities. Two other facilities are of potential interest: a gasoline station and a sulfur plant. The gas station was located along the south side of Carroll Road (the entrance road to the terminal) slightly northeast of the vegetable oil storage tanks east of Slip 1. The gas station utilized an approximately 2,000-gallon gasoline storage tank and pump in connection with the processing of military vehicles. It is not known whether the storage tank was above or below ground. The sulfur plant was located east of the bulk storage bunkers on Pier 5 (corresponding with the former location of the Oregon Sulphur Company).

Terminal 4 was returned to the City CPD in February 1946. In 1947, the War Assets Administration purchased the northern portion of the City CPD terminal occupied by Oregon Shipbuilding Corporation in exchange for property on the west bank of the river that the City CPD later developed as Terminal 2.

Ore and Concentrate Handling

Pre-1950. From its inception, Terminal 4 was designed to handle imports and exports of bulk cargo. Rail transport by OWR&N Co. and its successor, Union Pacific, was the chief means of conveyance for import and export cargo. Ores and concentrates were an important element of this traffic beginning in 1921 with the completion of Pier 5 on the southern edge of Slip 3. A large area for open storage, to the east and south of Pier 5, lay adjacent to eight covered concrete bunkers with sloping interiors, which were serviced by a series of belt conveyors. This was the mineral bulk-handling facility at Terminal 4, details of which are provided in Table A-3 based on information known to date.

Table A-3
Chronology of Pre-1950 Mineral Bulk Handling at Terminal 4

Ore	Status	Transfer Method	Storage	Period
Phosphate rock	Export	Railcar from siding unloaded to either track hopper or cradle unloader to bunkers or cars; contents were discharged to open area storage. Material traveled by conveyor belt from bunkers to loading towers on the harbor face (Berth 414) of Pier 5, where it was loaded directly into ships' holds.	Open storage or covered bunker	1921-1950
Sulfur	Import	Ships unloaded by Terminal 4 locomotive crane onto Slip 3 side of Pier 5 (Berths 412 and 413).	Open storage	1921-1945
Manganese ore	Export	Same method as used for phosphate rock.	Open storage or covered bunker	1924-1925
Zinc	Export	Same method as used for	Open storage	1925-1928

Ore	Status	Transfer Method	Storage	Period
concentrate		phosphate rock.	or covered bunker	
Coal	Ship fuel	Same method as used for phosphate rock.	Open storage or covered bunker	1923-1931, 1935-1936, 1940-1950
Chrome ore	Import	Same method as used for phosphate rock. Unloaded at Pier 5 in 1925 and at Pier 2 (Berths 406-408) in 1937-1941.	Open storage or covered bunker	1925, 1937, 1940-1941

Post-1950. At the end of World War II, the City CPD regained use of Pier 5 and constructed a new bulk outloader on the Slip 3 side of the pier (Berth 412) for handling expected cargoes of coal and phosphate. Starting in 1955, lead and zinc concentrates were directly transferred from ships in Slip 1 to open Union Pacific gondola railcars by two gantry cranes at Pier 2 equipped with clamshell buckets. The transfer of lead and zinc concentrates at Terminal 4 was relocated to Slip 3 (Berths 410 and 411) in 1961 with the completion of Pier 4 and the Dravo bulk unloading tower. The Dravo unloading tower remained in service until 1998, when it was decommissioned. Soda ash, initially exported from Pier 5, Berth 412, became a major export in 1988, when loading was transferred to Pier 4, Berths 410 and 411, where a new bulk outloader was constructed by Hall-Buck. Based on currently available information, details of these operations are summarized in Table A-4.

Table A-4
Chronology of Post-1950 Mineral Bulk Handling at Terminal 4

Ore	Status	Transfer Method	Storage	Period
Lead concentrate	Import	Gantry crane clamshell removed ore concentrate from ship hold to open railcar on Pier 2 (Berths 406-408) until 1961; Dravo unloading tower removed ore concentrates from ship hold to open railcar on Pier 4 (Berths 410 and 411) from 1961-1971. Railcars were spotted on Tracks 4-10, 4-11, 4-12, and 4-15. Cars were then pulled west to Tracks 4-2 and 4-3 for pushing under the Dravo loader. Loaded cars exited to the ladder tracks at the east of the pier for switching.	No storage	1955-1971
Coal	Export	Berth 412 bulk unloader; gantry cranes at Pier 2 also unloaded coal from barges.	Pier 5 storage bunkers	1952-1958
Zinc concentrate	Import	Same method as used for lead, same time frame.	No storage	1955-1971
Soda ash	Export	Bulk outloader; Pier 5-loaded railcars dumped soda ash into Berth 412 outloader, direct transfer to vessel. Pier	30,000-ton A-frame storage building at	1988-Present

Ore	Status	Transfer Method	Storage	Period
		4-loaded railcars traveled along face of dock, in strings of six cars, through one of two dumper buildings. Soda ash was either transported directly to ship via conveyor or taken to storage building for later shipment. Ships could be simultaneously loaded from storage and rail.	Pier 4 since 1993; no storage at Pier 5 (direct transfer from rail to ship only)	
Sulfur	Export	Transfer from railcars to barges by bulk unloader at Berth 412. After 1961, transferred by Pier 4 Dravo tower.	No storage	1955-1967
Alumina/Bauxite	Import	Gantry cranes at Pier 2 (Berths 406-408) removed ore from ship hold to Union Pacific railcars. After 1961, ships were unloaded at Pier 4 (Berths 410 and 411) by the Dravo unloading tower.	No storage	1955-1956, 1963
Ammonium sulfate	Import	Transferred from ship hold by Dravo tower into dump trucks.	Storage building south of Pier 5	1970
Bentonite clay	Export	Direct transfer from railcar to ship via Pier 5, Berth 412 bulk outloader via conveyor belt from railcars until new outloader constructed at Pier 4.	No storage	1967
Sodium sulfate	Export	Direct transfer from railcar to ship via bulk outloader at Pier 5 until new outloader built at Pier 4.	No storage	Not available
Soybean meal	Export	Direct transfer from railcar to ship via bulk outloader at Pier 5 until new outloader built at Pier 4.	No storage	Not available
Chromite	Import	Gantry cranes at Pier 2 removed ore from ship holds to Union Pacific railcars.	No storage	1956-1957
Ferro-phosphorous iron ore	Export	Transferred by Pier 2 gantry cranes from railcars (originating in Idaho) to SS *Jotunfjell* for shipment to Rotterdam, Holland.	No storage	1955-1957
Limestone	Import	Transfer from barge hold to railcar.	No storage	1966-1967
Manganese	Import	Gantry cranes at Pier 2 removed ore from ships to railcars.	No storage	1958
Potash	Export	Transferred from railcars to ships at Berth 412.	Storage bunkers	1959

Ore	Status	Transfer Method	Storage	Period
Rutile ore sand (titanium oxide)	Import	Transferred from ship holds by Berth 412 bulk loader.	Storage bunkers	1970
Talc	Export	Transferred from Burlington Northern railcars to ship holds by Berth 412 bulk outloader (Berth 401).	Storage bunkers	1966
Tricaphos (tri-calcium phosphate)	Import	Discharged by a marine leg and conveyor belts at Pier 1.	Storage bunkers at Pier 1	1961

The Bunker Hill Company and Hecla Mining Company's Sullivan Electrolytic Zinc Plant were the major consignees for lead and zinc ore concentrates during the 1955 to 1971 period. Anaconda Mining Co. (a former ARCO subsidiary) and American Smelting & Refining Co. (known as ASARCO) also imported ores through Terminal 4. The American National Soda Ash Consortium (known as ANSAC) has supplied Wyoming soda ash to the KMBT (formerly Hall-Buck Marine) facility at Terminal 4 from 1988 to the present day.

Pencil Pitch Handling

Pencil pitch is a coal tar distillate used as anode material at aluminum refineries throughout the Pacific Northwest. It is manufactured by extruding finger-width coal tar pitch "pencils." Available Port records indicate that pencil pitch was handled at Terminal 4 from 1978 to 1998. The pencil pitch was manufactured in Germany and China and purchased from Koppers Industries, Inc. Ships carrying the pencil pitch were moored at Berth 411 in Slip 3. Longshoremen removed the pencil pitch from the ships' holds by means of the clamshell-equipped Dravo unloading tower on Pier 4 and loaded it directly onto truck trailers or railcars adjacent to the pier.

In 1978, 13,161 short tons of pencil pitch arrived at the Port in several ships and were transferred to rail and truck carriers at Pier 4. In 1979, Jones Oregon Stevedoring Co. signed an agreement to handle bulk pencil pitch cargo at Terminal 4. That agreement was renewed in September 1982. In 1987, the Port leased the bulk cargo handling operations to Hall-Buck Marine, Inc. At that time, the Port was using the Dravo unloading tower to transfer an estimated 25,000 to 35,000 tons of pencil pitch annually. Hall-Buck Marine modified the Dravo mechanism in 1988 and the rear section of the loading hopper enclosure in 1992 to improve operations. Statistics indicate that 182,748 short tons of pencil pitch were unloaded from at least 28 ships between 1978 and 1989. Port records register 11 ships calling between January 1997 and June 1998. Ten of those vessels were affiliated with General Steamship Corporation, Ltd. In 1998, Hall-Buck Marine ended bulk import of pencil pitch at Terminal 4. The Dravo unloading tower was decommissioned that same year.

General Cargoes

Terminal 4 was chiefly designed to handle bulk (as opposed to break-bulk) cargo. The grain elevator, vegetable oil and molasses tanks, and the bulk mineral facility at Pier 5 have been prominent elements of the bulk cargo handling at Terminal 4. Other bulk cargoes imported or exported through Slip 1 and its adjacent piers and warehouses were wool, cotton, and natural rubber. The entities handling these cargoes and the time frames

involved are not presently known. Some break-bulk cargoes were processed through Terminal 4, including automobiles exported to the Far East beginning in 1925.

Prior to and during the terminal's use as a container station by Matson Navigation Company, the terminal was used to process whole log bundles for export to Japan.

In addition to the bulk storage plant for handling coal, phosphate rock, and other bulk products, the rear of the quay dock at Pier 5 had a 3.5-acre storage space available for lumber, logs, sulfur, and steel. The equipment used for loading and unloading these materials included two traveling towers, hoppers, tripper, chutes, bins, and automatic scales. The quay dock was removed from Pier 5 in 1962, and the bulk handling facility was demolished between 1968 and 1969. The bulk outloader on the slip side of Pier 5 was decommissioned and removed between 1990 and 1992.

City of Portland

The City of Portland owns a parcel of land adjacent to Wheeler Bay commonly known as the fire boat station parcel. When the Port and the City CPD were consolidated in 1971, the CPD's properties and functions were transferred to the Port. However, the fire boat station parcel was specifically exempted from the transfer of property. The exemption was recorded correctly, but the parcel was erroneously located on Multnomah County tax maps at Slip 1 instead of in Wheeler Bay. That error was corrected in 2002.

The City of Portland operated a fire boat station at Terminal 4 from a pier into Wheeler Bay from approximately 1960 through approximately 1986. At one point, the fire boat station was located on the upstream end of Wheeler Bay, attached to Berth 410. In approximately 1980, the Multnomah County Sheriff's Department moved a boat house and houseboat just inside the area closer to the head of the slip from the fire boat station. The City of Portland formerly utilized an approximately 1,000-gallon UST for the storage of gasoline. The former UST was decommissioned in 1995 and, following sampling of soil and groundwater, DEQ issued a No Further Action determination. The City of Portland relocated its fire boat moorage to the Port's Terminal 1 facility in 1995, at which time Carr Marine leased the ramp and floating dock to tie up barges. That lease ended in 1999. The fire boat parcel has been vacant since that time.

In 1986, the City of Portland constructed a municipal stormwater sewer conveyance system that drains properties located along North Lombard Street and North Roberts Avenue. The stormwater piping traverses the northern portion of the Slip 1 Upland Facility and ultimately discharges to Slip 1. The City of Portland refers to the outfall discharging to Slip 1 as Outfall 52C. According to City of Portland records, Outfall 52C is a 36-inch municipal storm drain with a catchment area of approximately 24 acres located above the railroad tracks east of the terminal.

Oregon Terminal Company

In 1988, the Port ceded control of overall operations at Pier 2 under a management agreement with Oregon Terminal Company (OTC) for operation of all break-bulk berths. OTC handled Berth 408, the ro-ro dock, and associated warehouses. In addition, OTC operated the old Quaker State building as a gearlocker. A rail-covered work pit was constructed west of the gearlocker building at that time. In addition, one 4,000-gallon UST for diesel and one 4,000-gallon UST for gasoline were installed with a fueling station on the south side of the

gearlocker building. An equipment wash station was installed on the slip side of the building; the wash station drained to the sanitary sewer. Both the USTs and the wash station were removed when the management agreement ended in 1996.

Other Facilities

A gearlocker building that was constructed in 1932, housed shops for carpentry, painting, blacksmithing, and repairs. In 1942, during the USATS's tenure, an internal, second-story loft was added to the one-story building.

A.6 Dredging and Filling History at Terminal 4

Dredging activity at Terminal 4 began with the work that provided fill for the general terminal space and created Slips 1 and 3 between 1917 and 1921. In the process, the former Gatton's Slough and adjacent Willamette River shoreline were reconfigured. Port of Portland dredges provided the dredged material for the City CPD's facility. Maintenance dredging of the slips and improvements to the terminal's harbor face occurred periodically in ensuing years. Table A-5 provides a chronology of dredging and filling events at Terminal 4.

Table A-5
Chronology of Dredging and Filling Events at Terminal 4

Month* / Year	Specific Area Dredged	Specific Area Filled	Estimated Volume (cubic yards)*	Description
1917	St. Johns Elevator and Terminal (Terminal 4)	Terminal 4 Upland		Slip excavation performed by Dredge Portland and "special channel" work performed by Dredge Willamette.
1918	St. Johns Terminal (Terminal 4)	Terminal 4 Upland		Slip excavation performed by Dredge Portland and channel work performed by Dredges Columbia, Willamette, and Tualatin.
Jan 1919	Terminal 4, Willamette River Channel	Terminal 4 Upland	21,950	Terminal development.
Jan 1919	Slip 1	Terminal 4 Upland	26,600	Terminal development.
Jan 1919	Slip 1	Terminal 4 Upland	30,400	Terminal development.
Jan 1919	Terminal 4, Willamette River Channel	Terminal 4 Upland	45,480	Terminal development.
Feb 1919	Slip 1	Terminal 4 Upland	34,400	Terminal development.
Feb-May 1919	Willamette River, Channel - Linnton	Terminal 4 Upland	631,060	Terminal development.
Apr-May 1919	Slip 1	Terminal 4 Upland	132,000	Terminal development.
May-June 1919	Slip 2	Terminal 4 Upland	69,200	Terminal development. Excavation of 1500-ft length and 200-foot width slip.

Month* / Year	Specific Area Dredged	Specific Area Filled	Estimated Volume (cubic yards)*	Description
May-July 1919	Terminal 4, Willamette River Channel	Terminal 4 Upland	294,240	Terminal development.
Aug-Dec 1919	Slip 2	Not verified	318,200	Terminal development. Excavation of 1500-ft length and 200-foot width slip.
Jan 1920	Terminal 4 Slips	Terminal 4 Upland	586,661	Terminal development.
Feb-Apr 1920	Terminal 4, Willamette River Channel	Terminal 4 Upland	683,200	Terminal development.
July 1920	Terminal 4 Slips	Terminal 4 Upland	39,360	Terminal development.
Sept-Dec 1920	Terminal 4 Slips	Terminal 4 Upland	271,584	Terminal development.
Dec 1920	Terminal 4 Slips	Terminal 4 Upland	11,445	Terminal development.
1921	Slip 2	Not verified.		Terminal development.
1921	Slip 3	Slip 2		Terminal development.
1921	Slip 2	Not verified.		Terminal development.
1921	Slip 3	Not verified.		Terminal development.
1921	Pier 2	Pier 3		Terminal development.
1921	Slip 3	Pier 4		Terminal development.
Oct 1923	Willamette River Channel below Terminal 4	Terminal 4 Beach	80,545	Dredging.
Oct-Nov 1923	Willamette River Channel below Terminal 4	Terminal 4 Beach	469,435	Job No. 1087: Dredging
Dec 1923	Willamette River Channel below Terminal 4	Terminal 4	218,230	Dredging.
1923-1924	Willamette River above Terminal 4	Weyerhauser Tract		Dredging.
1924	Piers 3 & 4	Not verified.		Dredging for construction of bulkheads and fills.
Aug-Sept 1924	Willamette River Channel above Terminal 4	Terminal 4 above	146,890	Dredging.
Sept-Oct 1924	Pier 5	Bank upstream from Terminal 4	107,010	Job No. 1100: Dredging.
Oct 1924	Shoal above Terminal 4	Terminal 4 above	187,300	Dredging.
1924-1925	Terminal 4 above	Land above Terminal 4	402,710	Dredging
1925	Willamette River	Land above		Dredging.

Month* / Year	Specific Area Dredged	Specific Area Filled	Estimated Volume (cubic yards)*	Description
	Channel	Terminal 4		
Nov-Dec 1935	Terminal 4	Not verified.	228,085	Dredging.
1935-1936	Willamette River Channel near Terminal 4	Lowlands above Terminal 4		Dredging.
1936	Terminal 4, Willamette River Channel	Not verified.		Dredging.
July-Aug 1936	Terminal 4	Not verified.	495,045	Dredging.
July-Aug 1936	Willamette River Channel, Terminal 4	Not verified.		Corps maintenance dredging (Job #1241).
1937	Terminal 4	Not verified.	187,651	Dredging.
Dec 1938	Associated Oil Company	Terminal 4, ashore below	190,960	Filling.
1941	Willamette River Channel below Terminal 4	Weyerhauser Tract		Dredging.
Feb-Apr 1941	Terminal 4	Not verified.		Dredging (CPD Project 1257).
Feb-Apr 1941	Terminal 4	Swan Island	823,640	Dredging.
Apr-June 1941	Slip below Terminal 4 above	Not verified.		Dredging. Contract 1260.
1942	Slip 1	Not verified.		U.S. Army Transport Service maintenance dredging.
July 1948	Willamette River Channel south of Pier 5	Head of Slip 2		Dredging for construction of oil dock south of Pier 5 (Job #1286). Initial filling of head of Slip 2
Aug 1948	Slip 3	Not verified.		Maintenance dredging.
1957-1958	Slip 3	Slip 2		Widening of Slip 3, dredging and final filling of head of Slip 2.
1962	Slip 1	Not verified.		Dredging.
1963	Terminal 4. Willamette River Channel	Oregon Shipbuilding Way-Ends		Dredging.
1968	Slip 1	Not verified.		Dredging.
1968	Willamette River Channel adjacent to Terminal 4	Rivergate		Dredging.
1969	Slip 3	Not verified.		Emergency dredging by Western Pacific Dredging to accommodate iron ore vessels.
June 1971	Willamette River Channel	Terminal 4	79,400	Locations and purpose not specified.

Month* / Year	Specific Area Dredged	Specific Area Filled	Estimated Volume (cubic yards)*	Description
1972	Willamette River Channel	Terminal 4 Auto Storage Area Bankline	700,000	Terminal development.
1972	Terminal 4	Rivergate		Dredging.
1973	Slip 2	Not verified.		Fireboat basin dredging.
Feb 1973	Willamette River Channel	Terminal 4	355,466	Locations and purpose not specified.
Nov-Dec 1974	Willamette River Channel at Terminal 4	Rivergate (Area 14)	908,836	Channel maintenance.
Jan-Mar 1975	Willamette River Channel at Terminal 4	Rivergate (Area 14)	1,938,550	Channel maintenance.
1975	Slip 1	Not verified.		Dredging of Berths 403-405.
1975	Slips 1, 2, 3 and Harbor Piers	Not verified.		Maintenance dredging.
1976	Terminal 4	Swan Island Lagoon	3,000	Maintenance dredging.
1977	Slips 1 and 3	Not verified.		Dredging of Berths 407-408 (Slip 1) and Berth 410 (Slip 3)
1980	Slip 2	Not verified	100	Material removed for future river patrol boathouse as part of maintenance dredging.
1983	Slips 1, 2, 3 and Harbor Piers	Not verified.		Maintenance dredging.
1984	Slip 3	Swan Island Lagoon	5,000	Maintenance dredging of Berths 410 and 411.
1987	Terminal 4	Ross Island	2,000	Maintenance dredging of Berth 401.
1987	Terminal 4 Auto Storage Area	Morgan Bar	1,800	Maintenance dredging of Berth 416.
1988	Slip 1	Not verified.		Maintenance dredging of Berths 403-408.
1988	Terminal 4	Morgan Bar	28,900	Maintenance dredging of Berths 401, 403-408, and 414-416
1994	Slip 3	Ross Island	35,000	Remedial dredging associated under Consent Decree.
1994	Terminal 4	Ross Island	2,300	Maintenance dredging of Berth 408.
1996-1997	Slip 3	Ross Island		Maintenance dredging of Berths 410 & 411.
1997	Slip 3	Not verified.	5,454	Maintenance dredging of Berths 410 & 411.
2002	Slip 3	Not verified.	2,250	Maintenance dredging of Berths 410 & 411.
2003	Slip 3	Not verified.		Maintenance dredging of Berths 410 & 411.

** where reported or available*

A.6 Current Uses at Terminal 4

Throughout the 1980s and 1990s, some of the buildings, equipment, and docks at Terminal 4 became obsolete and were removed. Slip 1 is not presently deep enough to accommodate deeper-draft modern vessels and current Port plans do not call for such deepening in the foreseeable future. In the late 1980s and early 1990s, Warehouse 4 was condemned and removed, and the original tanks at the bulk liquid storage facility near the head of Slip 1 were removed. In 1996, Berths 406 and 407 and their associated docks and warehouses were dismantled. The demolition of Berths 403 and 404 and associated Houses 3 and 4 followed in 1999. Bulk operations at Berth 412 (Pier 5) were terminated in 1989, and the wharf at Berth 412 was removed in 1997.

A.6.1 Tenant Operations

Current lessees within the Removal Action Area at Terminal 4 and their status are listed below.

Cereal Food Processors

Cereal Food Processors, Inc. (formerly known as Terminal Flour Mills) is currently in the last two years of a lease for approximately 1.6 acres at the flour mill facility at Terminal 4.

International Raw Materials

IRM is currently in year four of a 10-year lease (with two five-year option periods) for approximately 6.3 acres at the liquid bulk storage facility, excluding a Port building. The previous lease for the facility was assigned from PM-Ag to IRM in 1995.

Rogers Terminal

Rogers Terminal & Shipping (a division of Cargill Marine) is currently in "hold over" status with a lease of improved space east of Slip 1. The lease is for less than 1 acre and encompasses an 11,712-square-ft warehouse with 406 square ft of office space and a 15,451-square-ft yard. Rogers, a terminal service company, originally leased the space for stevedoring services supplied to Cargill's operation. Since Cargill is in the process of exiting its lease and is no longer operating at Terminal 4, Rogers is currently utilizing the leasehold for storage purposes. Rogers' initial lease agreement with the Port dates from 1983.

Rogers formerly utilized an aboveground used oil tank in connection with its operations. In addition, the Port removed an approximately 10,000-gallon gasoline UST from the Rogers leasehold in 1990. Sampling during decommissioning of the UST confirmed that there were no releases associated with the UST.

Kinder Morgan Bulk Terminals

In 1998, Hall-Buck was acquired by Kinder Morgan and renamed KMBT. KMBT continues to export soda ash through Slip 3. KMBT currently leases 6.56 acres adjacent to Berths 410 and 411 for ship loading of soda ash and/or unloading of bulk cargo from rail. The lease area includes rails, associated buildings, a storage dome, and utilities.

Additional agreements affecting Kinder Morgan's lease area include:

- Portland General Electric easement for underground line;
- Pipeline Crossing Agreement, Union Pacific (licensor) to Hall-Buck (licensee), allowing Hall-Buck to construct, maintain, and operate a pipeline; and
- Revenue Sharing Agreement with Union Pacific.

KMBT currently utilizes an approximately 5,000-gallon diesel UST located north of the Rail Dump building, an approximately 675-gallon AST located in the eastern portion of the facility, and an approximately 2,000-gallon sulfuric acid AST located within Building 432. In addition, KMBT utilizes an approximately 43,000-gallon open settling tank for soda ash wash-down water.

Schnitzer

The Port has a moorage agreement with Schnitzer Investment Corporation for a portion of the mooring dolphin that extends onto submerged lands adjacent to property owned by Schnitzer at the Berth 401 grain elevator.

A.6.2 Rail Trackage

Rail Usage

The rail trackage within the confines of Terminal 4 is owned by the Port. The Port leases portions of the rail trackage to individual tenants as part of their facility leases. The Terminal 4 rail system is designated as capacity that the Port will afford a tenant under terms of the lease. Older, renewable leases, such as the one currently in effect with KMBT, subsume the particulars of car movement and loading under the general term of "operations." Newer facility leases deal with all aspects of terminal transfer operations in detail.

Although not specifically addressed in older lease language, there are recognized responsibilities regarding rail activities at Terminal 4. Union Pacific, or any other railroad company involved in car transit and delivery, is responsible for the line haul of consigned product from origin to destination. This includes delivery of the cars to the terminal.

A.6.3 Adjacent Property Ownership and Operations

The Terminal 4 Removal Action Area is bordered to the north by Schnitzer Steel Industries and Northwest Pipe and Casing; to the north/northeast by the Burgard Industrial Park; to the south by the Terminal 4 Auto Storage Area, which is occupied by Toyota; to the east by Union Pacific rail tracks, beyond which is the Toyota processing yard and Toyota processing center; to the southeast by the Toyota upper lot; and to the west by the Willamette River.

The Schnitzer Steel Industries, Northwest Pipe and Casing, and Burgard Industrial Park properties and the Toyota Auto Storage Area, all of which border the Terminal 4 Removal Action Area, are discussed below.

Schnitzer Steel Industries

Schnitzer Steel Industries (Schnitzer), located at 12005 North Burgard Street, borders Terminal 4 on the north. Schnitzer processes, stores, and exports scrap metal (e.g., automobiles, appliances, and ferrous metal products) from its facility. Schnitzer also operates a deep marine terminal for bulk commodities. The property was the site of Oregon Shipbuilding Corporation's shipyard from approximately 1943 through 1945; between the late 1960s and 1972, Schnitzer reportedly conducted ship scrapping activities at the property. Schnitzer Steel Industries is listed as Oregon Department of Environmental Quality (DEQ) Environmental Cleanup Site Information (ECSI) #2355 and is currently under a Voluntary Cleanup Program (VCP) Agreement for remedial investigation of the site, which is ongoing.

Northwest Pipe and Casing

Northwest Pipe and Casing, located at 12005 North Burgard Street, borders Terminal 4 on the north. Northwest Pipe and Casing operates a welded steel pipe and coating manufacturing facility. Historically, the Oregon Shipbuilding Corporation shipyard, which operated from 1943 through 1945, extended onto the Northwest Pipe and Casing property. Beall Pipe operated a pipe manufacturing facility on the property from 1945 to 1983. Northwest Pipe and Casing, purchased the property in 1983. Northwest Pipe and Casing is listed as DEQ ECSI #138 and is currently under a VCP Agreement for remedial investigation of the site, which is ongoing.

Burgard Industrial Park

The portion of the Burgard Industrial Park that is adjacent to the north/northeast of Terminal 4 includes Boydstun Metal Works and Western Machine Works.

Boydstun Metal Works, located at 9002 North Sever Court in the Burgard Industrial Park, borders Terminal 4 on the north/northeast. Boydstun Metals Works fabricates and paints automobile transport trailers. Specific manufacturing activities include cutting steel and aluminum sheets and tubes, welding parts as part of trailer assembly, sandblasting, painting, and installing hydraulics and electrical control systems. Historically, the Oregon Shipbuilding Corporation shipyard, which operated from 1943 to 1945, extended onto the Boydstun property; between the late 1960s and 1972, Schnitzer reportedly conducted ship scrapping activities at the property. Boydstun is separately listed as DEQ ECSI #2362; however, the site has been incorporated into the Schnitzer Steel Industries investigation (ECSI #2355 described above), which is ongoing.

Western Machine Works, located at 12005 North Burgard Street in the Burgard Industrial Park, also borders Terminal 4 on the north/northeast. Western Machine Works fabricates and remanufactures components for the paper and pulp industry. Historically, the Oregon Shipbuilding Corporation shipyard, which operated from 1943 to 1945, extended onto the Boydstun property; between the late 1960s and 1972, Schnitzer reportedly conducted ship scrapping activities at the property. Western Machine Works is not listed in the DEQ's ECSI database; however, the site is included in the Schnitzer Steel Industries investigation (described above), which is ongoing.

Toyota - Auto Storage Area

Toyota Motor Sales, which occupies properties to the east, south, and southeast of the Terminal 4 Removal Action Area, holds a long-term lease agreement with the Port dating to 1976 for the storage and processing of automobiles. Historically, Toyota's facilities have been at Terminal 4 and above Terminal 4 on Lombard Street; the facilities are known as the upper and lower lots.

The Toyota area south of the terminal was first developed in 1969 and paved as a large-scale automobile import facility. A floating dock (Berth 417) was constructed in 1969, and a second floating auto dock (Berth 416) was constructed in 1972. In addition, Berths 414 and 415 were completed in 1974 for the handling of steel cargo.

In 1976, Toyota leased the import facility at Berth 416, and the processing plant was expanded in 1979. Berth 417 was relocated to the Port's Terminal 6 and a general cargo auto terminal was constructed there.

In 1986, the Port purchased the St. Johns Auto Wrecking Yard on Lombard Street above Terminal 4. Toyota entered into an agreement with the Port for approximately 69.2 acres of property, buildings, improvements, and dock rights located to the east and south of the Removal Action Area. Toyota exercised an option under the terms of the 1986 lease on October 30, 1989 for an additional 12-acre parcel farther upstream. On April 3, 1990, Toyota exercised another option under the lease for an additional 8.8-acre parcel located on the corner of North Lombard and North Roberts. A recent amendment extending the term of the lease also provided for closure of the "upper property" (east of the terminal) on North Lombard, including removal of the underground fuel tanks.

In 2002, Toyota Motor Sales, U.S.A., Inc. (also known as Toyota; TLS, Logistics) entered into a separate lease agreement for approximately 82 acres south of the Terminal 4 Removal Action Area, which includes a vacated portion of North Bradford Street.

Toyota's current operations include unloading automobiles from ships that dock at Berths 414 and 415, driving the cars to designated yard areas, and storing the vehicles awaiting processing, which includes fueling and washing vehicles, installing accessories, and making minor repairs to damage caused during shipping.

A.7 Planned Future Uses at Terminal 4

The Port is currently involved in master planning to guide development and redevelopment to the year 2020. Terminal 4 will remain one of the Port's primary marine terminals for the foreseeable future. Options under consideration for Terminal 4 generally involve retaining the existing terminal purposes of handling grain, autos, and dry bulk and liquid bulk cargoes. Most of the alternatives under consideration emphasize the continued use of Slip 3 and deemphasize the use of Slip 1.

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